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United Nations Industrial Development Organization

Third Meeting of the Advisory Group
of the Industrial and Technological Information Bank (INTIB)

Vienna, Austria, 13-17 March 1989

INTIB PROGRAMME: AN OVERVIEW*

Prepared by the

UNIDO Secretariat

* This document has not been edited.

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I. INTRODUCTION

Some ten years ago, following United Nations General Assembly Resolution 31/183 on the establishment of a network for the exchange of technological information as well as the Vienna Programme of Action on Science and Technology for Development UNIDO has carried out a number of action-oriented activities to facilitate and accelerate a greater flow of information to INTIB users.

The approach of the Secretariat in providing a broader base for its operations through the development of a network of national/regional focal points and the elaboration of the UNIDO Industrial and Technological Information Programme was approved and endorsed by UNIDO IDB.

Within this context, during the last three years UNIDO has re-oriented the activities of INTIB. They include:

Generation of industrial information through better and more efficient use of the existing information systems in the organization (INDIS (IDA/LINK) Energy Information System (EIS), TIES, INPRIS);

Improvement of the Industrial Inquiry Service with greater emphasis on networking through establishing and supporting INTIB National Focal Points and Nodes;

Introduction of modern data processing techniques in INTIB and its NFP and training staff in their effective use;

Establishment and development of specific data bases;

Incorporation of the INTIB concept in UNIDO's Technical Assistance Programme to provide assistance in formulating national industrial information policies, building-up and strengthening national and regional information infrastructures and networks, promoting new information technologies, such as on-line connections and use of electronic mail, creating industrial data banks, and training and up-grading information specialists.

In addition, UNIDO's first attempt to standardize the approach to information exchange, in a network environment, was recently launched – the European INECA network (Industrial Energy Conservation Abstracts) – designed to record, exchange and disseminate factual information related to the activities of a number of sectoral focal points. Nine countries and forty institutions are associated in the first stage of this network.

The approach taken in the INECA network has now been transferred to the subject of clean technology, a subject of great importance to both developed and developing countries.

The Constitution of UNIDO as a Specialized Agency ascribes various functions to UNIDO in assisting developing countries, and most of these functions require the back-up of industrial and technological information. In addition,

the Constitution specifically states that the Organization shall "serve as a clearing house for industrial information and accordingly collect and monitor on a selective basis, analyze and generate for the purpose of dissemination, information on all aspects of industrial development on global, regional and national as well as on sectoral levels including the exchange of experience and technological achievements of the industrially developed and developing countries with different social and economic systems".

The role played by information in the selection and application of specific technologies and in the formulation of policies and strategies for industrial and technological development has become more crucial in the context of technological exchange.

The period 1990–1995 will be a critical phase in the industrial and technological development of developing countries. New technologies will broadly affect industries and services, the organization of production and the pattern of comparative advantage. Technological advances in fields such as biotechnology, micro-electronics, telecommunications, new materials, fine chemicals, marine industrial technology, energy and manufacturing technology bear far-reaching implications for the industrial and technological development of developing countries.

So, the problem is not only one of an increasing volume of diverse information, but also of the capacity to enjoy access to it through modern information transfer techniques and to analyze it so as to turn it into an effective decision-support resource.

That is why, industrial and technological information services are an important component of UNIDO's new programme approach to development and transfer of technology.

II. REVIEW OF INTIB ONGOING ACTIVITIES

The Industrial and Technologicl Information Bank (INTIB) including UNIDO's Industrial Inquiry Service, is the major mechanism through which UNIDO transmits reliable and continuous information to developing countries. Today INTIB provides a comprehensive service offering a combination of on- and off-line information, technical assistance, access to data bases and several series of related publications. Its overall task is to compile and disseminate information requested by developing countries and to help strengthen their own industrial and technological information systems. INTIB will search in any field of industrial technology but concentrates on technologies and equipment for 20 selected industrial sectors. INTIB also cooperates with other UN organizations to develop specialized information systems and data bases.

INDUSTRIAL INQUIRY SERVICE

The INTIB Industrial Inquiry Service (IIS), popularly known as UNIDO's mail order technical assistance, is a developing country industry's link with both the wealth of information maintained by UNIDO as a whole and the large number of data banks and information sources around the world to which UNIDO has access. INTIB's objective is to ensure a quick, easy flow of information to people who require it when selecting technology. Compared to most other , bibliography-dominated, information services, IIS is nearly unique in providing concrete, practical packaged information for industrial enterprises in response to specific queries and needs.

INFORMATION SYSTEMS AND DATA BASES

Technology-related information is held by UNIDO in the following systems and data bases:

The Industrial Information System (INDIS) is a computerized form of the Industrial Development Abstracts (IDA), UNIDO-generated information held as some 17,000 titles and abstracts. Some 100 new entries each month; covers technical and other reports, feasibility studies, working papers presented at UNIDO meetings etc. Access is on-line. Available in micro-computer form and on tape for mainframe computer. We plan to make the data base available in the near future on CD-ROM.

The On-Line Information Key (LINK) information-generated outside UNIDO through Industrial Inquiry Service – directories of research and development institutions for specific topics or sectors such as metallurgy, non-ferrous metals, industrial biomass, solar energy, sugar by-products and fruit and vegetables. Available in printed and micro-computer form.

Technological Information Exchange System (TIES) – information abstracted from technology transfer agreements of the participating countries. The information is only accessible to institutions offering similar data on a confidential, reciprocal and mutually beneficial basis.

Energy Information System – on-line data base with an established thesaurus of energy key-words. It contains periodical reports on UNIDO's energy activities.

Technology Supply Data Base – offers of technology, joint venture opportunities and requests for technology. 50 institutions from 35 countries contribute technology profiles to the data base. Available in micro-computer form.

Petrochemicals and pharmaceuticals data bases – initial stage of development – information on products, processes and raw materials.

Through INTIB, inquirers from developing countries may also gain access to other UNIDO data bases, namely:

UNIDO Statistical Data Base – central reference point for statistical data in the manufacturing sectors; information on 80 countries.

Investment Promotion Information System (INPRIS) – computerized data files:

- Project file – data on over 3,000 industrial investment project proposals in developing countries;
- Investor file – a directory of over 3,900 public and private enterprises;
- Bank file – directory of some 600 development finance institutions;
- Institution file – ministries of industry, investment promotion agencies etc.;
- Sponsor file – developing country firms potentially interested in redeployment possibilities;
- Country investment profiles – general country data.

Expert Roster for Industry – data base on individual experts in various industrial sectors;

Purchase and Contracts Data Base – information on manufacturers/suppliers of equipment in various industrial sectors and on engineering consulting companies and their services;

External Data Bases – access to bibliographic and directory-type data bases through the VIC Library.

NETWORKING, ADVISORY SERVICES, TRAINING AND TECHNICAL ASSISTANCE

INTIB technical assistance develops linkages and communications with end-users in developing countries and enhances their capabilities in the systematic handling of industrial information. It also promotes the availability and utilization of technological information in decision-making processes in industrial development, in which technology selection plays an important role.

End-user linkages enabling exchange and transmission are organized as an INTIB network made up of national focal points (NFPs) and nodes – information sources specializing in industry and technology – chambers of commerce, associations of small and medium industries, research and development institutions, engineering consulting firms, development banks, technology transfer promotion agencies etc. Plans are in hand to link NFPs and nodes on-line with UNIDO. For this purpose, INTIB initiated and successfully implemented projects for DPRK and Mongolia in establishing on-line access to different world-wide data bases including UNIDO's own; for various countries in Europe and Africa in introducing electronic mail techniques using IBM INS network, UN ICC and GEISCO. INTIB assistance is also used to encourage and develop national industrial information policies and to train industrial information specialists. INTIB advises developing country institu-

tions and policy-makers on technological information and organizes training workshops.

INTIB also encourages and helps developing countries to set up their own industrial and technological data bases, either nationally or regionally, providing expert advice and assistance.

JOINT PROGRAMMES AND CO-OPERATION AGREEMENTS

INTIB is engaged in joint programmes and co-operation agreements with specialized information systems of United Nations agencies, for example with the United Nations Environment Programme (UNEP) in its International Referral System for Sources of Environmental Information, with the United Nations Development Programme (UNDP) in the Technological Information Pilot System, with International Labour Organization (ILO) in a joint publication on Technical Memoranda and with the Food and Agriculture Organization of the United Nations (FAO) in the International Information System for the Agricultural Sciences and Technology. There are other joint programmes include one with the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the Energy Conservation Technology Information Exchange System, with the World Intellectual Property Organization (WIPO) in the patent information system and with the International Atomic Energy Agency (IAEA) in the International Nuclear Information System.

INTIB also co-operates with ITC, WHO, ECE, ISO, IDRC and FID and on a regional level with ICSTI, APCCT, ARCT, CARIRI, ALIDE and WAITRO.

PUBLICATION PROGRAMME

UNIDO's printed publications supporting and emanating from the development and transfer of technology programme including newsletters, serials and special reports, directories and abstracts.

* * *

In our opinion, the further development of UNIDO information activities depends to a great extent on national users' support and to this end our activities should correspond to the needs and requirements of developing countries to utilize UNIDO information resources fully, which in turn requires the existence of national organizations responsible for industrial information activities in their irrespective countries, which actually constitute the INTIB network of national focal points and nodes.

In close co-operation with INTIB, National Focal Points are generating, disseminating and assisting the small and medium enterprises to apply industrial and technological information in the technology selection process.

All of us clearly understand that effective use of information depends as much on what is given as on how it is used. Processing and targeting information on the part of INTIB is as important as the capacity to handle and use information at the national level. We in the UNIDO Secretariat are aware that the capacity to use the information provided effectively is indeed a crucial determinant of the results of an activity such as INTIB and do not really have to dispair with Eliot and ask "where is the wisdom we have lost in knowledge" and "where is the knowledge we have lost in information"?

The objective of the Third Meeting of the Advisory Group of INTIB is to:

- Review INTIB's activities following its re-orientation and approval of the Industrial and Technological Information Programme;
- Operation of INTIB – Regional National Focal Points – network, modus operandi for focal points and INTIB global network project proposal;
- Co-ordination and co-operation between INTIB and other UN and external data bases for effective utilization of existing technological resources for INTIB end users with emphasis on computerized networking for environmental technology;
- Review and finalize INTIB's human resource development programme based on concrete proposals from various member countries; and
- Develop vision for INTIB in the 1990s.

The work of the meeting is organized in two panel discussions:

- Panel I: INTIB in the 1990s
- Panel II: Computerized Networking (with emphasis on environmental technologies).

The findings and recommendations of both panels will be presented and discussed on Wednesday afternoon and Thursday morning at the Plenary Sessions. The afternoons of Thursday and Friday are reserved for hands-on sessions and demonstrations of INTIB and other data bases and telecommunications-related works.

May I, in conclusion, express our hope that the discussions during these three days will contribute to creating a vision for INTIB in the 1990s that is derived from the actual needs of UNIDO member countries.

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ENHANCING THE INFORMATION FLOW WITHIN AND TO DEVELOPING COUNTRIES-

UNIDO ISSUE PAPER*

Prepared by the

UNIDO Secretariat

* This document has not been edited.

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In order to enhance the information flow within and to developing countries (including the establishment of access to international information services, which are mainly managed by developed countries), substantial and well-organized efforts are required to develop appropriate methodological frameworks and informatics infrastructures, covering communications, hardware and software.

1. Methodological framework

Step 1 – Identify needs

The first important phase, when establishing national informatics infrastructures, is to identify the types of basic network services needed to provide and utilize information services.

Step 2 – Investigate existing infrastructure

The next step is to investigate the national technical infrastructure, taking into account the following :

- existing networks and services

It is important to know if experience in using and operating information networks already exists. During the design phase (step 3), the necessity to incorporate existing and emerging networks should be considered.

- public services

Public data network services are crucial for system design, the X.25-type packet-switching services being paramount.

- use of standardized products

Standardized products facilitate implementation of an informatics infrastructure, the lack of which entails further development work, which is expensive and time consuming, but necessary.

The above items should be examined in order to obtain a clear picture to enable system design.

Step 3 – Design

We must then design the system we envisage. The overall architecture of an information infrastructure can be determined, based on available applications and technical possibilities and taking into consideration the following:

- end-user (workstation) access to facilities (physical means);
- local system architecture (LAN, gateways);
- communication infrastructure at the national level. (public data networks, private network, managed data network, etc.);
- access to international networks and information systems;
- information systems – structure, DBMS;

- user software interfaces.

Step 4 – Implementation

The selection and installation of appropriate micro- mini- and mainframe computers, communication devices and software should be carried out taking into account the availability of standardized and off-the-shelf products. Before regular operation of information services can be started, the following steps, in order of priority, are recommended:

- development phase – functional characteristics;
- testing phase – performance and reliability;
- experimental operation – user requirements;
- normal operation – maintenance, monitoring and evaluation of services, economy, service development.

Step 5 – Education and billing

- training of users and service providers;
- documentation – for users, managers, system designers;
- accounting – establishing a model for information services, taking into account international practices.

2. Informatics infrastructure

The previous chapter listed methods for assessing and developing informatics infrastructures – the respective components will now be considered.

2.1 Basic network services

There are some basic network services that are vital to the provision and use of information. Considering international experience and standardization, the following are recommended:

- message-handling for electronic mail;
- file transfer between users and/or information services;
- line-oriented remote terminal access to access external databases;
- directory services for accessing outside users and information resources.

2.2 Communication infrastructure

Implementation of national information networks, with international connections, will depend on the actual situation in a country and on planned or existing communication infrastructures (by local PTT authorities).

In particular the following should be considered:

- is there a public data communication network in operation in the country?;
- if there is a network available, then the information infrastructure should make coordinated use of it;

- if there is no public data communication network available, then the question is – is the PTT willing to operate a private network?;
- if yes, then it should establish a managed data network, based on a packet-switching service, with X.25 and PAD interfaces;
- if the PTT is not ready to operate a private network, then it should at least provide either digital leased-line services, or voice-grade leased-line services.

In order to extend national data communications to include international traffic, efforts should be made to obtain information from neighbouring, or other cooperating countries, on their present and planned data communication facilities. If work towards establishing links with other national data communication networks is already under way, this could be accelerated by setting up experimental network connections and by assisting potential network users who urgently wish to access other countries.

2.3 User-friendly interfacing and access to information services/databases

One of the most important requirements, is to allow users with a minimum of knowledge, both regarding computer technology and database management, to access desired information. For this purpose, a user interface is needed, which is capable of providing the following facilities:

- it should allow the design of user-oriented menus. In the framework of designing such menus, the definition of headings to be used, screen-attributes, programme calls and the loading of new menus should be facilitated. The programme calls should activate all services required by the user;
- database selection should be possible via the main menu (appears on the screen when the programme is started).

A substantial aspect of user-friendliness is the management of communications between the user and the network – such a communication interface should:

- hide details of the network calls from the user;
- allow access to services provided on a remote computer using a language with an easy-to-use syntax, e.g. one similar to PASCAL;
- facilitate the intelligent solution of problems arising in the network;
- provide means for bridging differences between coding systems of the local microcomputer and the remote host;
- in general, make accessing of remote services easy for any user with little training and experience in the management of computer networks.

Regarding access itself, two modes should be envisaged:

- line mode (this is at present the basic objective, even though it will disappear in the long-term);
- screen mode.

It should be stressed, that when the questions of interfacing and access are solved in hardware and software terms, a study of the economic/financial aspects should be undertaken before services are introduced. A system allowing simultaneous use of several databases, applying window techniques, will have a proportionately high running cost for communications and related items, which may become prohibitive from the point-of-view of economic viability. Similarly, the screen mode of accessing a database may be technically possible, but if it costs much more than line-mode, the latter may be preferable, economically.

2.4 Software tools for advanced information processing

Software tools for national network use should be selected and if necessary, adapted to local conditions, prior to the establishment of a national information and informatics infrastructure with links to other countries and international service providers. Tools should be selected on the basis of international experience, and acquired for testing and evaluation. These activities should be undertaken in a harmonised, coordinated manner by institutions wishing to participate in national networking activities. In particular, database management systems, the use of compact disk technology, etc. could be studied and evaluated.

3. Management of an Infrastructure project

An information infrastructure project is necessarily complex – a number of institutions participate, some as information providers, others as communication service providers, others again being interested in software selection, testing, installation or training, etc.

Such a complex activity needs appropriate management tools and facilities, in particular a project database and electronic mail facilities.

A project database may include information on:

- participating institutions;
- experts in charge of specific activities;
- content contributing to the creation of the nationwide network – objectives, outputs, activities, inputs of various sub-projects;
- tools used in connection with the project, in particular standards, guidelines, etc.;
- products resulting from cooperative efforts, such as system design, test reports, comparative studies, decisions made, agreements, etc.

Electronic mail facilities can be established with a limited number of functioning participants, and be used at least as a learning device, which could later be extended, as the development of computer networking in a country allows. Equally, use may be made, in early stages, of facilities offered by another country having the necessary computing capacity and software.

4. Activities relating to computerized networking

During the last year and a half, the topic of networking and computerized information handling, has been the subject of discussions in many UNDP-funded European regional projects.

In a UNIDO-executed project, a software application has been developed, using micro-ISIS software, that is already in use in ten centres dealing with energy conservation in industry. UNIDO has also joined discussions related to a UNESCO-executed project, which is looking at information networking in the context of decision-making for selected priority sectors of the participating institutions.

There is a working group within the latter project examining basic computer and communication tools that will support the topical questions being examined and the institutions involved have expressed their willingness to transfer the results and experience gained to developing countries. A number of documents and reports, covering the methodological framework for networking, with items corresponding to those recommended in this issue paper, are planned for the near future.

The activities envisage making extensive use of the CDS-ISIS software developed by UNESCO, which is available both in mainframe and microcomputer versions for use on IBM and compatible computers. This software is well-known in developing countries. It is foreseen that a number of improvements to this software will be implemented, *inter alia*:

- a user-friendly interface, which has already been elaborated for micro-ISIS – the TEKA – providing twenty menus and twenty possible variations for selection. Five languages can be used on each installation and programmes are started automatically;
- the introduction of links between fields in a record (in micro-ISIS), allowing. e.g. to specify connections between authors and projects, authors and institutes etc., in records containing several authors, institutions, etc.
- international character handling, which, in the mainframe version of CDS-ISIS, will be enhanced by allowing on-line modules to recognize all Roman characters, permitting the use of different types of terminals in a system.

5. Contributions of UNIDO

UNIDO has a long-established major mechanism for the transmission of reliable and continuous information to developing countries, with a view to meeting the specific needs of Government departments and institutions, manufacturing enterprises and enterpreneurs – the Industrial and Technological Information Bank (INTIB) – which includes an Industrial Inquiry Service. During the last three years UNIDO has carried out a number of activities to facilitate, increase and accelerate the flow of information to INTIB users, including:

- the generation of industrial information through better and more efficient use of existing internal information systems, such as INDIS, the Energy Information System (EIS), TIES, INPRIS;
- the improvement of the Industrial Inquiry Service with greater emphasis on networking through establishing and supporting INTIB National Focal Points;
- the introduction of modern data-processing techniques in INTIB and its National Focal Points and training staff in their effective use;
- the establishment and development of specific databases, *inter-alia* CLEANTEC DATA for environmental technologies,
- the incorporation of the INTIB concept in UNIDO's technical assistance programme, to provide assistance in formulating national information policies, building up and strengthening national and regional information infrastructures and networks, promoting new information technologies, such as on-line connections and the use of electronic mail, creating industrial databanks and training and upgrading information specialists.

UNIDO's first attempt to standardize the approach to information exchange in a network environment was recently launched – the European INECA (Industrial Energy Conservation Abstracts) network has been designed to record, exchange and disseminate factual information related to the activities of a number of sectoral focal points, national training centres and national contacts. UNIDO's aim is to facilitate the flow of information to developing countries, in particular by the means of standardized computer applications, standards established for electronic communication and the provision of methods for accessing external computerized information sources.

Microcomputer applications (*inter alia* INECA and CLEANTEC DATA in standardized form), use the micro-CDS-ISIS software package. Links between this software and other software tools, in particular desk-top publishing, which is already being used to convert UNIDO databases directly into typeset quality hard-copy output, are being developed.

6 CONCLUSION

Taking the above points, raised in sections 1–5, into consideration, as well as questions raised by the various papers submitted, UNIDO's Industrial Information Section requests participants at this panel to discuss the following:

- what are the main computer-based topics to be developed by UNIDO INTIB in the 1990s, to enhance the flow of information to developing countries?
- what steps should be taken, in order of preference, to develop a "global" UN-based computerized system for information exchange?
- which data base owners/vendors could be willing to join in the above effort to pass on existing information sources to developing countries?

Recommendations on these questions, and any others worthy of future development, must be realistic in terms of United Nations capacities and budgetary restrictions.

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I. FINDINGS AND RECOMMENDATIONS

INTIB in the 1990s

1. The Advisory Group was of the opinion that the 1990s will be characterized by further development of industrial and technological information activities, better and more extensive use of modern information technologies, broadening of national and international information markets and more competition within the information environment.

2. The Group acknowledged current INTIB activities, assessed the new initiatives taken by the Industrial and Technological Information Programme and endorsed the recommendations of the previous INTIB Advisory Group meetings and workshops.

3. The Group agreed that substantial efforts should be made to improve the industrial information activities of UNIDO to meet the growing requirements of users at national, regional and international levels. Evaluation of users' information needs in developing countries was considered crucial.

4. The Group stated that UNIDO/INTIB activities in several cases have been affected by problems that were partially dependent on the local situation and to an extent linked to inadequate infrastructure, external support and a lack of trained manpower.

5. A concerted approach needs to be made at the UN level to examine compatibility among various UN and external databases. Where such compatibility does not exist, techniques such as gateways, menu driven interfaces, expert systems (artificial intelligence), conversion tools etc. should be employed.

6. Recognizing that international communications networks are becoming increasingly important to developing countries and that there are inherent constraints to the establishment of telecommunications linkages, the Group urges the relevant UN system organizations to make a concerted high level approach to developing countries, as yet unconnected, to consider accessing external information sources through the UN system.

RECOMMENDATIONS ADDRESSED TO MEMBER STATES

1. Member States may consider ways to improve awareness of the importance of industrial information in the development process.

2. National industrial and technological information authorities are invited to consider the promotion and impact of local INTIB services and products for industrial growth.

3. Existing information resources should be better exploited and made available to a wider range of users. Modes of intensive exploitation and marketing of local resources should be developed.

4. The industrial information provided by INTIB should be repackaged and

tailored to the local needs and market requirements, where possible.

5. The location of the INTIB national focal point (NFP) is of prime importance for its efficient and effective operation. It should, therefore, be appropriately selected and effort should be made to place it within its national industrial information systems and suitably link it to other information systems in the country.

6. Local authorities should consider the need for human resources development in order to use advanced information technologies effectively. UNIDO and the regional centres have also an important role to play in this respect.

RECOMMENDATIONS FOR EXTERNAL ASSISTANCE

1. Telecommunications and information dissemination systems in some developing countries for use of databases and other information services, in general, and INTIB systems in particular, are at present inadequate. UNIDO in co-operation with external sponsors should

(a) assist in setting-up packet switching telecommunications nodes; and

(b) explore the possibility of sharing telecommunications costs for use of INTIB services at least for the initial phase.

2. Modern tools for information processing and transmission, e.g. diskettes, tapes, CD-ROM, telefax and others, will be necessary to improve the industrial and technological information services in developing countries, for which external assistance would be required.

3. User-friendly personal computer oriented turn-key solutions, such as menu driven interfaces, design of information systems, hardware, software, training etc., may be introduced to accelerate the process of establishing and/or strengthening the activities of NFPs.

4. Human resources must be developed for the specialized jobs in the field of industrial, technological and business information.

5. The usefulness of industrial and technological information is linked not only to the provision of bibliographic and factual information but also to advisory services or extension services to end-users. Such advice will be mainly linked to technological, business and legal support.

6. Efforts in developing countries to promote co-operation in the field of industrial and technological information should be supported within the framework of Technical Co-operation Among Developing Countries (TCDC).

RECOMMENDATIONS ADDRESSED TO UNIDO SECRETARIAT

1. UNIDO should continue to encourage and aid, where possible, the development of national industrial information infrastructure(s) in developing countries.

2. Technical co-operation projects should be initiated for the improvement of INTIB information activities. Important ones are:

- Model for better exploitation and marketing of local information resources;
- Study of inter-linkages between market, small and medium enterprises and research;
- Availability of business information for small and medium enterprises;
- UNIDO/INTIB referral system and networking;
- Establishment of an International Technology Information Centre;
- Establishment of advisory services for helping NFPs and end-users in the handling of industrial, technological and commercial information.

UNIDO may take steps to formulate and evaluate the above projects with the support of external experts, when necessary.

3. UNIDO/INTIB should support national efforts for database development and operation with special emphasis on its national focal points programme.

4. The products and services of industrial information are increasingly commercially oriented. External assistance would, therefore, be required to have access to public and commercial databases. An examination of appropriate financial support mechanisms to this end should be undertaken by UNIDO.

5. UNIDO should continue co-operation with other industrial and technogical information agencies with a view to providing access to their databases in a most favourable way.

6. UNIDO/INTIB should establish an inventory of relevant existing information sources world-wide and conduct an assessment of these sources.

7. UNIDO should take into account the changes in economic and industrial trends that are taking place and adjust the industrial information services it provides, to suit such changes;

8. The information systems of NFPs and UNIDO should be compatible with each other and with external information systems that are being used, to the greatest extent possible. This would be desirable in order to facilitate information exchange through the global INTIB network;

9. INTIB should monitor the evolution of new information technologies and should encourage the use of feasible alternatives for information processing, e.g. CD-ROM, on-line networking, telefax, electronic mail, etc., taking into consideration their economic viability in developing countries.

10. The Computerized Documentation System (CDS)/Integrated Scientific Information System (ISIS) – CDS/ISIS – is a widely accepted menu-driven generalized Information Storage Retrieval System, particularly suitable for handling small and medium size applications. It is distributed free of charge to institutions in developing countries by UNESCO. A formal and active

interaction should be developed between UNIDO/INTIB and UNESCO, the software producer, for harmoniz: g new developments and improvements keeping in view the NFPs' data processing needs. At the same time UNIDO should organize, in co-operation with UNESCO, an INTIB-based international ISIS users group, taking into consideration existing regional or national ISIS users groups, where applicable.

11. UNIDO/INTIB should not lose sight of traditional methods of information dissemination such as printed outputs, user documentation, abstract materials, thesauri etc.

12. UNIDO, in close co-operation with other international agencies, should identify institutions that maintain environment-related databases. It was noted that WHO (Regional office for Europe) would be willing to provide UNIDO with its environmental health series and officially distributed reports from its environmental health information system meetings. A working group meeting might be organized by UNIDO to discuss common approaches to a network for exchange and dissemination of information for the reduction of environmental pollution with specific reference to industrial technology, taking into account existing information systems and networks.

13. The Group acknowledged with satisfaction the offers made by several countries and regional centres in providing various training courses for INTIB users and these could be promoted through the "*INTIB Net*" newsletter and other media;

14. UNIDO should formulate a detailed human resource development programme for INTIB national focal points based on the offers made by the member countries and regional centres;

15. The Group decided that UNIDO should continue to provide information free of charge to developing countries, while acknowledging, in principle,that its products and information services could be charged for. An investigation should be made of a possible charging system for end-users who are likely to make commercial use of the information provided by UNIDO.

16. UNIDO should establish and/or strengthen linkages with other international, regional and national organizations engaged in similar activities, through the exchange of material and expertise and the implementation of complementary programmes and projects.

II. INTRODUCTION

Background Information

The United Nations General Assembly passed Resolution 31/183 on the establishment of a network for the exchange of technological information, particularly para 9, concerning the establishment of the Industrial and Technological Information Bank (INTIB) in UNIDO, and UNIDO Industrial

Development Board (IDB) Resolution 47(XI). The Vienna programme of Action on Science and Technology for Development also stressed the importance of strengthening the national technological information capabilities of developing countries.

In this connection, during the past nine years, UNIDO has carried out a number of action-oriented activities to facilitate and accelerate a greater flow of information to INTIB users. In the context of recommendations of the Advisory Group made in its second meeting, UNIDO has reoriented the activities of INTIB during the last 3 years. They include:

- Generation of industrial information through better and more efficient use of the existing information systems in the organization (INDIS (IDA/LINK), Energy Information System (EIS), TIES, INPRIS);
- Improvement of the Industrial Inquiry Service with greater emphasis on networking through establishing and supporting INTIB National Focal Points and Nodes;
- Introduction of modern data processing techniques in INTIB and its NFPs and training staff in their effective use;
- Establishment and development of specific databases, inter-alia CLEANTEC DATA for environmental technologies and Technology Supply Database for industrial technologies;
- Incorporation of the INTIB concept in UNIDO's Technical Assistance Programme to provide assistance in formulating national industrial information policies, building-up and strengthening national and regional information infrastructures and networks, promoting new information technologies, such as on-line connections and use of electronic mail, creating industrial databanks, and training and up-grading information specialists.

Objective:

The objective of the Third Meeting of an Advisory Group for INTIB was to bring together experts to review the elements of an action programme to re-orient the activities of INTIB in the light of the conclusions of the Second INTIB Advisory Group Meeting.

The meeting discussed the following themes:

(1) Review of INTIB's activities following its re-orientation and approval of the Industrial and Technological Information Programme;

(2) Operation of the INTIB (Regional and National Focal Points) network, modus operandi of focal points and INTIB global network project proposal;

(3) Co-ordination and co-operation between INTIB and providers of other UN and external data bases for effective utilization of existing technological resources for INTIB end users with emphasis on computerized networking for environmental technology;

(4) Review and finalize INTIB's human resource development programme based on concrete proposals from various member countries; and

(5) Vision for INTIB in the 1990s.

Organization

The Advisory Group Meeting was attended by 55 participants from various member countries, international organizations, observers and UNIDO consultants.

Delivering the welcome address on behalf of the Director-General of UNIDO, the Deputy-Director General, Department for Industrial Promotion, Consultations and Technology, described the basic thrust and strategy of UNIDO and more particularly the role that is envisaged for industrial and technological information. He referred to the significant changes taking place in industry as it gradually transforms from a material-based to an information- or knowledge-based activity. In this context, therefore, collection and dissemination of industrial and technological information, for which INTIB has the primary responsibility, becomes a vital pre-requisite for success. He commended the work being done by INTIB in the field of industrial and technological information. He mentioned that the meeting of the INTIB Advisory Group of experts was timely and appropriate to chart a course for the Bank's activities to be in line with UNIDO's overall strategy for the next few years as laid down in the medium-term plan for 1990–1995.

Election of officers

The meeting was invited to elect Chairmen for the meeting, Panels I and II, and a rapporteur. The meeting unanimously elected:

1. Chairman for the meeting and Panel I: Professor Adam Wysocki, Adviser, Institute for Scientific, Technical and Economic Information, Poland

2. Chairman for Panel II: Mr. P. Bakonyi, Deputy Director, Computer Automation Institute, Hungary

3. Rapporteur: Mr. Vinay Kumar, Industrial Adviser, Directorate General of Technical Development, Ministry of Industry, India

III. WORKING SESSIONS

Four papers were presented in the plenary session. The first paper related to an overview of INTIB's activities and future plan of action. The second paper on enhancing the information flow within and to developing countries described the necessary informatics infrastructure for satisfactory computerized networking. The next paper stressed the important role of INTIB/UNIDO in the establishment of a global network for scientific and technological information. The last paper gave information on the various methods of telecommunication used by INTIB and presented a comparative analysis.

After the plenary session, the Group split into two panels for intensive discussions.

- Panel I: INTIB in the 1990s
- Panel II: Computerized networking (with emphasis on environmental technology)

In Panel I nine reports were presented. These related to the scenarios in different regions and guidelines for establishment of NFPs, training in the area of information management, project proposals made in the previous advisory group meetings and other INTIB fora. The reports in respect of regional situations highlighted the activities of the International Centre for Scientific and Technical Information (ICSTI) as INTIB's regional service center, technology information scenario in Africa through the ARCT and the current status and development opportunities for industrial information resources and services in the Latin America and the Caribbean regions by ECLAC. The paper on a guide to the establishment of INTIB national focal points dealt with various aspects relating to the establishment and or strengthening of the effectiveness of national focal points. The papers on training and educational aspects referred to the new trends in those areas and emphasized the importance of this vital input for the success of any information system. Offers of training facilities were also made. The paper on extensive exploitation of information resources referred to projects to be taken up that were based on the previous recommendations of UNIDO/INTIB meetings. A paper on the use of industrial, technological and business information by enterprises in developing countries referred to a project proposal on increasing the efficiency of information use by enterprises in developing countries.

In panel II, six presentations were made. The first presentation highlighted a MicroCaires based information system for project promotion in ACP countries. The second presentation was on the FACTS database, which contains approximately 15,000 records on industrial accidents. FACTS also holds information in terms of 60,000 pages microfiches. A presentation on the UN Network system gave background information on the DialCom for electronic mail, as currently utilized by various UN offices. Details were provided on the special features of DialCom and its cost-effectiveness over conventional methods like telex. The next presentation described the metallurgical database, METADEX, which has about 840,000 records on the material properties. It was pointed out that considerable emphasis should be given to the printed form of information apart from the modern electronic storage methods. The next presentation highlighted the role of clean technology databases for influencing industry to adopt environmentally sound technologies. The sixth presentation entitled "Technical Information at Nippon Steel Corporation" highlighted the extensive and effective use of a technical information system to improve corporate efficiency. The Advisory Group also had a meeting with the ACC Task Force on Science and Technology for

Development. They were appraised of the conclusions arrived at by the Group, particularly those requiring external assistance. The conclusions may provide useful input for the working of the Task Force.

The Advisory Group discussed the recommendations of both the panels. Based on those discussions, final recommendations were formulated.

Presentations

Presentations were made on:

- UNIDO/IBM Electronic Mail Communication Network and other networks used by INTIB;
- INTIB databases (OFFR/REQT/VENT/IDA/IDAA/INQ/INECA/CLEANTEC DATA/NODE/RESEARCH INSTITUTE DIRECTORIES);
- The use of electronic publishing techniques in INTIB, in particular the linkage of micro CDS-ISIS and desk top publishing software to produce typeset output directly from databases;
- Various communication packages and databases by participants;

A list of documents and country papers appears in Annex III.

IV. ADOPTION OF THE REPORT

After detailed discussions, the meeting adopted the Report. The meeting made a strong recommendation to UNIDO and the Member States for early implementation of the activities suggested at the meeting.

V. ACKNOWLEDGEMENTS

The meeting expressed its deep appreciation for the efforts made by UNIDO for the organization of the meeting and offered special thanks to UNIDO for providing excellent host facilities.

ANNEX I – List of participants and observers

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Annex II – Meeting Programme

Monday, 13 March 1989

08.30–09.15 Registration

09.30–10.00 Opening ceremony

Welcome speech on behalf of Mr. Domingo L. Siazon, Jr. Director-General, UNIDO

10.30–10.45 Election of Chairman/Plenary Rapporteur and two panel leaders Panel I: INTIB in the 1990s and Panel II: Computerized Networking (with emphasis on environmental technology)

10.45–12.30 Presentations

1. INTIB Programme: an Overview - UNIDO Secretariat paper

2. Enhancing the Information Flow within and to Developing Countries – UNIDO Issue Paper

3. Role of INTIB in the Establishment of a Global Network for Scientific and Technical Information by Prof. R. Seiful-Mulukov

4. INTIB Telecommunications by Ms. D. Patoprsty

Discussion

14.30–17.00 Short presentation of papers by participants at panels and discussions

Tuesday, 14 March 1989

09.30–12.30 Panel discussions (continued)

14.30–17.00 Panel discussions (continued)

Wednesday, 15 March 1989

09.30–11.00 Preparation of panel findings

11.30–13.00 Joint session with ACC Task Force on Science and Technology

Presentation of the panels findings

14.30–17.00 Discussion of Panel I findings at plenary session

Thursday, 16 March 1989

09.30–12.30 Preparation of the final report Hands-on sessions and demonstration of INTIB databases, electronic and desk-top publishing, and telecommunication networks

14.30–17.00 Adoption of the report

Closing address by the Deputy Director-General, Department for Industrial Promotion, Consultations and Technology

Friday, 17 March 1989

09.00–17.00 Individual discussions with meeting participants on possible technical cooperation projects and mutual programmes

14.30–17.00 Hands-on sessions and demonstration of INTIB databases, electronic and desk-top publishing, and telecommunication networks (continued)

Annex III – List of documents

1 Aide-Memoire

2 Meeting programme

3 List of participants

4 INTIB Programme: An overview UNIDO Secretariat paper (ID/WG.486/1)

5 Enhancing the information flow within and to developing countries - UNIDO Issue Paper (ID/WG.486/2)

6 Role of INTIB in the establishment of a Global Network for Scientific and Technical Information by Prof. R. Seiful-Mulukov

7 Intensive exploitation of information resources for small and medium size industrial enterprises by Prof. A. Wysocki

8 A guide to establishment of INTIB's national focal points by Mr. V. Kumar

9 The ICSTI activities as INTIB regional focal point by Mr. A. Butrimenko

10 Information resources management training in companies by Ms. R. Launo and Ms. M. Karivalo

10A IAS proposals on global network project and human resources development by Mr. Y.A. Savostitski and Y.A. Fontanov

11 Strengthening technology and industrial information in developing countries – a project proposal

12 Summary report of the Advisory Group to UNEP on "low- and non-waste technologies" by UNEP/IEO

13 The AGRIS system by IAEA

14 FACTS – A database for industrial safety by Mr. L.J.B. Koehorst

15 Technical information system at Nippon Steel Corporation by Mr. T. Okano

16 Materials information – Its products and databases by Mr. M. Furneaux

17 Computerized information retrieval: the experience of the Centre for the Development of Industry(CDI) by Mr. B. Adenaike

18 Background on LNWT database at CESE, IIT Bombay and an approach towards computerized networking of information on environmental technologies by Mr. P.M. Modak

19 Elements of the role of informatics in the health-for-all-policy by WHO

20 ECLAC Data bases: A short guide to its information resources and procedures by ECLAC/CLADES

21 The insertion of an international industrial information system in the

information networking environment of Latin America and the Caribbean by Mr. J. Cubillo

22 FAO's contribution to a better flow of scientific and technical information for agricultural development by Mr. E.K. Samaha

23 NETT: A network for environmental technology transfer by Mr. J.E. Matty

24 The United Nations electronic mail network system by Ms. A. Cannata